Frankly Speaking

Traffic Engineering to the Rescue

John Darr, President of the Institute of Public Relations in a recent statement said that he is "amazed at the amount of conflicting reports and statistics which are being published concerning the various factors involved in traffic accidents."

Mr. Darr quotes three separate statements which appeared in the New York Times, one citing three major causes as (1) Failure to obey traffic laws, (2) Substandard traffic laws, and (3) Differences in regulations and traffic control devices in various states. He quotes an analysis which showed that "one out of nine drivers in fatal accidents had been drinking." Then he brings in a third quote "two out of every three serious accidents . . . result of faulty brakes and other mechanical defects."

John Darr is 100% right. It is unwise to confuse the public with many and conflicting statements of causes of traffic mishaps. The statements he quotes are undoubtedly correct, but the connotation of "cause" is unfortunate. Accident researchers know there are always many causes for an accident, and to single out one or two as "the cause" is misleading.

There is nothing confusing or conflicting about remedies for traffic hazards. Whereas it is difficult, and sometimes impossible to prove the cause of an accident, it is easy to prove the effect of a remedy, particularly an engineering remedy.

Traffic engineering does get positive unequivocal results. In ten cases studied recently (see page 251, April issue) accidents were 100% eliminated by traffic engineering improvements. Other case histories included in this study showed 75 to 100% reduction.

Let's hear less talk about what's wrong and more talk about how to correct it. Maybe then the public will see the picture more clearly and be more inclined to cooperate.

Henry Evans

Editor

New York State Plans More and Better Highways

by FRED W. FISCH, *Member I.T.E.*
Principal Civil Engineer, Bureau of Arterial Route Planning
New York State Department of Public Works

THE beginning of a new transportation era in New York State was heralded at Liverpool, just north of Syracuse, on July eleventh. The event was the ceremony marking the inception of the State's projected Thruway when Governor Thomas E. Dewey, in turning the first spadeful of earth, set underway this $202,000,000 construction program.

The occasion was the culmination of several years of groundwork and preparation. It was evidence of the administration foresight in having enacted broad legislation which recognized the need for extensive highway planning. This legislation not only provided for a super highway stretching across the state of New York to Buffalo and thence to the Pennsylvania state line, but also state-financed arterial routes for speedy and safe access into the very hearts of the urban centers marginal to the thruway route.

It is one thing to plan capital projects and another to be in a position to construct them. To this end sound fiscal policies have been adopted and closely adhered to, providing a post-war construction fund not proportionally equalled by any other state of the union. This financial backlog insures the actual construction of the planned highway system as rapidly as manpower and material supplies will permit.

Preliminary Planning

The period preceding the initiation of the first step in the Thruway construction program saw much intensive work on the part of the State Public Works Department engineering staffs at Albany and throughout the various district offices. Under direction of Superintendent Charles H. Sells and the District Engineers, preliminary reconnaissance, location studies, planning and replanning, design and details occupied the attention of field and office men. For this work existing personnel was augmented by additional engineer talent, returning from service in the armed forces and war industry.

When completed within the next five years the Thruway will not only connect the state's two most important ports, New York City and Buffalo, with express highway facilities, it will span and serve its most densely populated and most highly industrialized sections.

Population Served

Within a belt extending thirty miles on either side of the new Thruway is a region representing approximately 50% of the area of the state. But viewed from other angles it assumes still greater proportions. Within that belt reside approximately 90% of the state's population and nearly 81% of all motor vehicles registered in New York State are located. It also includes 86% of all of the state's buses and trucks. Almost 90% of all monies collected by the state for vehicular and operators' licenses are obtained in that same area. Existing highways spanning it have the highest traffic counts of any in the state.

Industrially and commercially it is equally important.

Present highway facilities in that "L" shaped region have been found inadequate to accommodate the demands placed upon them. Annual traffic counts reveal this situation. Many cannot be expanded further because of prohibitive land and construction costs. They are rapidly approaching the saturation point and the only practical solution lies in the construction of an entirely new route, the Thruway.

Design Features

The Thruway system will be a 486-mile multiple-lane highway with divided arteries separated by safety malls of varying widths. Rights of way will have a minimum width of at least 200 feet, affording ample opportunity for further expansion if necessary in years to come. Sight distances will be no less than 1000 feet at any point with a minimum radius of curvature set at 2800 feet. No grades in excess of 3% are planned.

The entire route will be devoid of obstacles to the easy flow of traffic. Intersections at grade will be non-existent. No traffic lights will blink along its course. Bridges and underpasses will be provided for cross traffic with access and egress to the Thruway limited to those points at which appropriate traffic interchange facilities will be built. Acceleration and deceleration lanes will be provided at such junctions to permit the traveler to enter or leave the Thruway with a minimum of difficulty and a maximum of safety. Plantings will be accomplished on the separating malls wherever necessary to provide effective screening of the headlight of approaching vehicles.

The economic significance of the Thruway has been evidenced by plans already made by large industrial organizations to seek factory sites along its route and at points sufficiently near large centers of population from which manpower may be readily obtained.

A study of the Thruway map, depicting its course as now defined by legislation, will indicate its close proximity to the cities it will serve. Maximum benefits will result from this policy. Adequate arterial connections will be provided between such urban centers and the Thruway. Property values will be enhanced in regions served by the express highway and its connections.

The New Urban Arterial Bureau

The entirely new phase of the State Highway Law which permits State construction of highways in cities brought about the establishment of a Bureau of Arterial Route Planning for that specific portion of the State Highway program. This new section of the State Public Works organization, under direction of B. D. Tallamy, Deputy Superintendent, devotes its attention particularly to the urban area problems, working with the district engineering offices and local officials. The Bureau organization is set up to include traffic and planning engineers, highway and valuation engineers, art delineators and analytical aides. The Urban Arterial Route phase of the overall highway program is most likely to be one of special interest to local planners and engineering officials.

The immediate responsibility of the Arterial Route Planning Bureau is the organization of comprehensive traffic surveys in urban centers throughout the state and consultation with the District Engineers and their staffs in the preparation of the urban area reports. The Buffalo traffic survey was completed in March, 1946 and the Urban Area Report completed three months later. By early September, eighteen of these surveys were completed.

Traffic Surveys

In general, this element of the arterial planning program includes traffic volume counts at critical points along major street systems, origin and destination surveys of passenger vehicles and trucks, parking practices and trip purpose, time and delay studies on congested major highways, and studies of special intersections and areas.

The twelve hour traffic census, normally conducted between 7 A.M. and 7 P.M. follows a standard procedure for this type of survey. Because of the manpower problem these counts are scheduled for a Tuesday or Thursday preceding the date of the Origin and Destination survey which is set for a like day on the following week. Survey stations are manned by personnel from the district offices, the county assistants' offices and, where necessary, the state employees are supplemented by others hired for the special purpose. The number of persons required for such a census will vary from 50 to 250 depending on the size of the community. Vehicle volumes in each direction are recorded for each hour of the survey either by manual checking, the use of denominator indicators, or automatic traffic counters, where this equipment is available.

The return postal card is being used for the Origin and Destination surveys, with the exception of that in Mechanicville for which a sample of motor vehicle operators are being interviewed. Where the cards are used a series of questions printed on government postal cards inquire as to the place where the trip began, where it ended, route followed, major intersections passed, type of vehicle, purpose of trip, method of parking, whether at curb, in a garage or in parking lot. The time of day and the station at which the card is to be passed out are indicated previously on the card by members of the survey staff. A colored instruction card is also prepared and issued along with the Origin and Destination survey postal card. This card instructs the driver to fill out the replies as soon as possible and drop the completed postal card in the nearest mailbox. The trip to be described by the motorist is in one direction only —not the round trip. Each driver is requested to accept one card during the day of the survey.

Origin and Destination stations are selected so as to form a complete cordon around the city limits and also at the periphery of the central business district and where necessary additional stations are located to intercept cross-town travel. Survey and instruction cards are given to inbound motorists only for the twelve hour period from 7 A.M. to 7 P.M. In special cases the hours of the survey have been advanced so as to intercept an earlier home to work peak hour movement. The number of cards issued are counted at each station giving an additional check on volume at outer cordon stations and permitting expansion of the returned card figures for interior stations to a total volume figure for each location.

Other Agencies Help

Police control of traffic is furnished through cooperation of the division of State Police by assignment of troopers to outer cordon points and where officially requested by local authorities to inner points. In general, however, stations within cities are manned by local police, and in instances by firemen or deputy sheriffs.

Fullest cooperation has been given by local authorities in connection with the surveys and in the furnishing of street and planning maps, traffic data when available, pre-survey publicity and other aids. At Rochester the City Planning Commission supplemented the state survey by conduct-

ing a similar motor vehicle study covering stations not included in the state schedule which were of particular interest to the planning officials. Interchange of this information will be helpful to the state and the city in the development of the Rochester Urban Area plan.

A vehicle speed and delay study forms another important part of the complete traffic survey for each community. This field survey, made by driving with traffic and recording total running time between designated points, and length and cause of delay enroute, is designed to develop information as to the cause of congestion on major streets and to establish an average overall running time between points of origin and destination. When related to existing street capacities and future estimated volumes, speed and delay data supply additional basic information for the design of a new thoroughfare pattern, including the widening and improvement of existing streets as well as the construction of new thoroughfares and serves as an index to the planned efficiency of the proposed new arterial system.

Special studies of problems in the congested industrial and commercial areas and at important intersections are conducted where necessary for the purpose of planning and design.

Experience has shown that the bulk of the returned Origin and Destination cards are received in about two weeks. The card returns are coded by the district office survey staff and analyzed by making use of electrical counting machine equipment through a contractual arrangement with local I.B.M. Service Bureaus. The survey cards have been designed insofar as practicable to be self coding so that the I.B.M. operator can punch out the tabulating card directly from the check marks on the postal cards. However, due to the extent of the information which is requested, particularly the places of origin and destination, some coding by the district office survey staff is necessary. The manual coding of Origins and Destinations which is the assignment of appropriate numbers to the street addresses, plants, or public buildings indicated by the motorist as the beginning or end of his one way trip, is preceded by the preparation of an area or zone map. These zones are related to the principal thoroughfares and when possible conform to U. S. census tracts.

O & D Results

The final tabulation sheets from the I.B.M. offices give the following information:

1. All traffic from all stations to all destinations for the twelve hour period.
2. All traffic from all origins, through all stations, to all destinations for each hour of the twelve hour period.
3. Twelve hour summary of the above.
4. Traffic from all origins, through each indicated intersection or combination of intersections, to all destinations for each of the twelve hourly periods.
5. Twelve hour summary of the above.
6. Heavy truck movement from each origin through each indicated intersection or combination of intersections, to each destination for each of the twelve hourly periods.
7. Twelve hour summary of the above.
8. Passenger car movement from each origin through each station to the central business district, together with the purpose of the trip and the method of parking for each of the twelve hourly periods.
9. Twelve hour summary of the above.
10. Special studies as required.

From these tabulations analysis of the Origin and Destination data is made.

The foregoing outline indicates the scope of the survey being made by the district engineers' offices. Succeeding steps in the study relate this traffic data to the overall community plan. During this phase of the work frequent consultation is held with local engineering and city planning officials as well as with interested civic organizations.

Planning Data Needed

The planning of a major thoroughfare system is essentially closely related to the land use pattern of a community. It also takes into account population distribution not only as existent but in relation to aprojected future population and possible shifts in location and variation of densities. The studies consider the trends of decentralization and growth of the outlying suburban areas as an important factor in the development of the desirable overall plan. Other factors having an effect are increases in motor vehicle registration and its future distribution in the urban area, any potential expansion or decentralization of the central business district and any contemplated industrial development. Having assembled this information, the study of the overall plan for the major thoroughfare system can be advanced.

The City Arterial Route Plan

The development of the City Arterial Route plan contemplates the fullest use of the existing street system where the physical conditions of sufficient right of way, grade, alignment and location fit into the general pattern. Where it appears to be impractical to develop the full widths for the required capacity new locations are studied which in many cases involve right of way through built up areas. When such areas are substandard in character the urban redevelopment principle is met in part, as the new thoroughfare will permit and should encourage reconstruction and improvement of abutting usage along the cleared right of way.

The prime consideration in the design of the new arterial system is safe expeditious movement of passenger, transit and commercial vehicles between points of origin and destination. This calls for free flowing traffic, using adequate traffic lanes with a minimum of interference by cross or entering traffic. Where the anticipated traffic volume warrants plans will provide for separations and interchanges.

Terminal Facilities

Due regard has been given to the importance of facilities at the termini of the arterial routes and express highways leading into the central district and other congested areas. While this is considered to be primarily a problem for consideration by local authorities the planning of the major thoroughfare system will be related to practical location of parking areas whether they be surface, multi-deck or underground, as well as to truck and transit terminals. In connection with the traffic planning for the City of Syracuse, the City Planning Commission and the Bureau of Traffic and Lighting are studying the problem of location of off-street facilities in the central business district. In Schenectady this same problem is also being given serious consideration by the City Planning Commission and the Department of Traffic and City Planning. One major proposal now under study by Schenectady officials is the redevelopment of a twenty-two block area adjacent to the central business district.

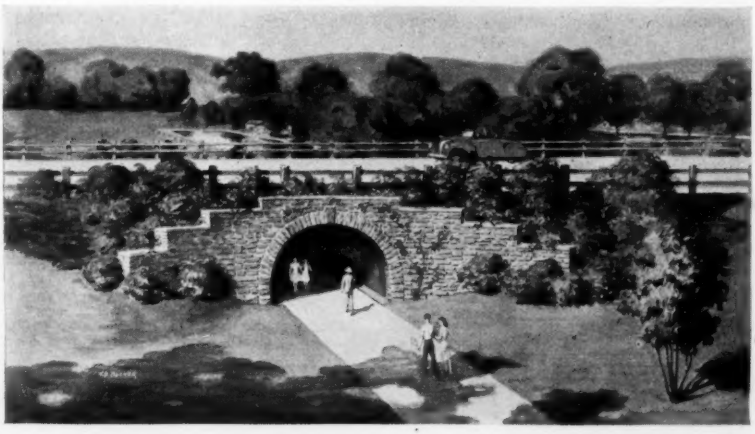
As noted previously the entire program of the State Department of Public Works is one of close cooperation with local communities. Illustrative of this is the procedure followed

in connection with a highway project in the City of Corning, N. Y.

Studies made by the Department District Engineer indicated the desirability of relocating a major highway entering the city. The location of the outer section of the route was fixed by a bridge crossing over an adjacent river, and from this point into the city the plan was based upon the most advantageous alignment which included an elevated roadway through a principal city park area.

Under many conditions this procedure might be considered undesirable, but in this instance careful cooperative planning produced a project design which is held to be an asset rather than a liability. For example, the final alignment of the highway forms a natural and desirable separation between the active and passive recreation areas of the park. The embankment slopes were flattened to conform with the natural terrain and the planned landscaping is in harmony with the surrounding park area. The pedestrian and vehicle undercrossings, providing convenient access from one section to the other have been especially designed as to location and aesthetic treatment. Cut stone facings on the undercrossing structures will blend with the landscaping features, which planting will, in addition, conceal the safety fencings which are to be installed to discourage junior pedestrians from crossing the highway area. The accompanying illustrations reproduced from water color drawings prepared by the art staff of the Bureau of Arterial Route Planning portray the type of structures contemplated. The originals along with an artist's birds-eye view of the park area and the proposed route were designed to convey a precompletion picture of the project to the city officials and interested citizens.

The end result of this type of cooperative planning, which extends beyond the mere design and construction of a highway is most satisfactory. The users of the completed highway through the park area will traverse a beautified and attractive entrance to the city. Their immediate impression and reaction should be favorable. The design and landscape treatment of the side slopes blends an essential utility into an equally essential community recreation area, without producing the effect of a barrier or a scar upon the scenic values. To have the sports



activities somewhat divorced from the area of quiet recreation has natural and desirable advantages. The safety provisions are integral among the modern features of planning and design.

Considered in relation to the millions of dollars of contemplated highway work, the problems of the entrance to the City of Corning may seem to be trivial. However the New York State program recognizes the importance of problems like these as they affect the local communities and in the development of the individual project plans full consideration is given to the needs and best interests of the community being served.

While the methods and procedures established by the Department are of a nature that fit best into a state wide pattern of organization, where necessary the local application is modified to fit special conditions. Upon completion of the surveys and studies of each community, the resulting report and plans are transmitted to the local chief executives having jurisdiction for their review and for study by their official organizations. Upon mutual agreement between state and local governments the stage is set for the actual construction program.

Priority of Constructions

The extent and sequence of construction projects is dependent on several factors, among which the urgency of relief on certain thoroughfare is of prime importance. If new location through built up areas is required the problem of land acquisition and prospective demolition of occupied dwelling units enters the picture. In this instance, where estimated land costs for new right of way amounts to a considerable sum of money the matter of the community financial position has a direct bearing, for under the arterial law although the state pays full cost of planning and construction the local government must assume one-half of the cost of right of way. Fortunately most urban centers are in a position to assume reasonable expense of this character, due in no small part to programs of sound local fiscal planning which will be strengthened by the "Moore Plan" of state financial assistance. This policy of state financial aid to communities, local debt reduction and local conservative spending can now pay dividends.

The statewide program of the Department of Public Works illustrates another advance in the field of state and local joint effort and cooperation. The Department with its greater supply of deversified technical manpower is in a position to expedite the early accomplishment of the planning process. The wealth of information which is being gathered and translated into concrete proposals will be of real value to local planning and engineering officials in the study of related problems.

The immediate future will see the city traffic load greatly eased by the segregation of local and through traffic, with the thruway syphoning off cross state traffic from the city streets and the arterial routes providing speedy and safe access to urban centers for traffic having local destination.

—*Reprinted from New York State Planning News*

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The Problem of Traffic Control and Street Facilities

by COLONEL ROBERT C. F. GOETZ

President, Eno Foundation for Highway Traffic Control

ROADS ARE built for travel—or better to say for safe, efficient travel—and there is a great deal of travel in our country. I regret to say it is not all safe; neither is it all efficient. This is clearly proven by the enormous toll of accidents and by the intolerable traffic congestion in our cities and towns.

The pre-war toll of 40,000 traffic deaths in 1941 and the economic accident waste of approximately two billion dollars are deplorable. The congestion and snail pace speed on many city streets are a waste of time, a test of public patience and a shocking example of the seriousness of our traffic problem.

Hasty America on Wheels

The automobile is a part of the American daily life— literally the United States of America is on wheels.

In 1941 there were more than 34,000,000 motor vehicles in use in this country—one for about every four inhabitants. This was 70 per cent of the world total. They were being driven about 300 billion vehicle miles per year. These figures to me are astronomical. I will leave further interpretation to the reader.

In our country everyone appears to be in a hurry. There is good reason for this and it is as it should be. I think I can give you some good reasons why.

Haste has grown to be a national characteristic; competition is keen; we work hard and fast; it is a part of our national economy; we play hard; we like pleasure and demand a great deal of it; we are sociable; we like to travel; it is the age of speed—life is short and we have much to do.

Public Demands Unpredictable

I presume we all agree that there is a very necessary and direct relation between traffic control and highway and street facilities. Traffic is the basis for such facilities and the amount of traffic to be efficiently accommodated should be the determining factor of the type and extent of such facilities. Unfortunately, there are other influences, hard to combat, and they are not always conducive to the best interests of traffic.

At a glance, it all seems a simple problem, but it is not, for at some point along the line there enters the great general public. It is for them that the roads are built and it is they who pay for the roads. Their demands and their requirements are various and indeterminate and the liberties they may take with the facilities made available to them are unpredictable.

Personally, I have the greatest sympathy for the road builder, the car owner and driver, the pedestrian, and the traffic agencies. It seems to me that we are all in one boat. If we are to have efficient use of available facilities, those existing and those to come, all of us will have to row together. Our attitude will have to be an unselfish one with due regard for the rights of others—or cooperation.

You have heard it said that "Patience is a Virtue." But too often, patience and the man behind the wheel are strangers and too often there is very little Good Neighbor Policy on our highways. Basic characteristics of human attitudes, behaviors, and abilities are as plainly and truthfully reflected in traffic as in any other general human endeavor.

The problem of traffic students or experts resolves itself into three general classifications:

Engineering
Education
Enforcement

Those sound so well and so convincing I wish I could add another "E" as "effort" or "endeavor" and invite the wholehearted participation of the public and of those whose business and desire it is to correct or improve the chaotic conditions that sometimes exist.

It appears to be a logical approach to my subject to discuss somewhat more in detail the three headings above. If each of these were carried out perfectly, our program would be comprehensive and obviously would result in a complete solution.

But as we so quickly learn, that is not the way things work in a practical world, and we have no grounds for an early expectation of a traffic millenium.

Being practical, if for no other reason than by force of circumstances, many activities exist whose objective is the improvement of traffic. Automobile travel and parking has become a problem of grave concern to the country and our Federal government.

Interest in the problem springs from every source, for the individual or association of individuals that does not have some contact with automotive transportation is rare and is living in an almost forgotten age.

A Prediction for the Future

While prediction is seldom safe, may I say at the risk of argument that the influence of the automobile's future will be greater than its past. This is a way of saying that our problems in traffic may be worse before they are better unless our corrective measures are greatly increased and intensified.

It has and will continue to affect the geographical distribution of our growing population and where the people are, things will be done. It has become the covered wagon of today.

In the application of any traffic improvement program, the engineer, the

educator and the enforcement agencies must expect to meet numerous and varied obstacles; programs must be far-reaching, far-sighted and continuous. And it is important that all efforts be coordinated if we are to have a worthwhile, well-balanced program. Consultation and discussion before may eliminate many hurdles later.

The Engineer's Approach

The engineer, I feel, has a certain advantage in that he can approach his problem from a technical or scientific point of view with a broad background of experience to guide him. In general, he definitely knows the best way to do his job if sufficient funds are available to him. He has the further advantage of definitely improving his methods with the tests of use and time.

I think most persons will agree that the road builder in particular has done a remarkable job. He can point with great satisfaction and credit to his professional progress exemplified by some of the marvels of bridge and highway construction.

While my experience has been brief, I feel he fully appreciates the problems of those who must guide and direct the use of the facilities he provides. It should be a source of satisfaction to his pride of origination to see his accomplishment put to its maximum usefulness.

Without his foresight and appreciation of the technical activities of traffic operations, he will increase the problems of the Traffic Engineer.

The Educator

The educator has a different role. His is not the case of the master and his pupil. The objective of his program may be as clearly defined but his ways of reaching it are not. The public is a difficult pupil and does not always accept the obvious, though it may be the best. They vie for an advantage, not always having due consideration for the other fellow and not always with due consideration for the consequences of their actions.

Safety educational activities should seek public cooperation. They should create in the driver a sense of judgement and fair play, for the risks he takes are not confined to him alone.

The pedestrian should be made to appreciate the problems of the driver and the capabilities of the machine he operates. The rights of all should be respected. Our safety programs should develop a safety consciousness reaching the individual to convince him that the progress of such efforts or the success of such programs will be measured by public support.

Enforcement

Police and enforcement agencies have an important part in traffic control. Without them no program can be more than only partially effective. Police have the responsibility of enforcing the law, but I would not say their part is entirely restrictive. Truly enough, they may restrain the individual, but that is only part of their important role of efficiently directing traffic. All road users are not angels and all are not Lord Chesterfields. Police, by their personal contacts, are in a position to and should create traffic courtesy. Courtesy could be their most effective weapon. But no program should place the burden of its application on the police or traffic enforcement agencies.

Public Officials Must Act

Needed cooperation and complementary action is dependent upon the understanding, interest and support of public officials. The public, for its part, must insist that its elected and appointed officials give traffic its proper place in relation to other public matters. As a public service it must support traffic programs if it is to reap its reward in safer and more efficient highway transportation.

State governments should thoroughly interest themselves in Planning, Financing, Education, Legislation, Enforcement. This interest should be continuous and progressive with due regard for neighbors whose boundaries are contiguous. Too often their interests are centered in one phase of the state's development activities, frequently with an eye on future elections. They should be guided by professional advice and the wealth of information available to them.

This is not to lay full blame on the general public for chaos or our difficulties in traffic and we should not approach the problem from any such one-sided point of view, for I do not believe we will ever arrive at a satisfactory solution without the wholehearted support of the public. A solution by enforcement leads to ever-increasing restrictions which in turn lead to greater and greater confusion, which in the end impede movement in traffic. And that, to my mind, is fundamentally incorrect and is the least desirable of all approaches in any program for traffic improvement.

Granting that we build the best facilities that science and the engineer can provide, it is reasonable to propose that we undertake the next logical step of educating the public to efficiently use such facilities. Such a program should be carefully considered with a view toward inviting and securing the public aid with the least disconcertion to it - - not one that will incur the public ire.

No doubt, this is easier said than done—to that let us agree. Some may say "impossible"—to that let us not agree.

With the matter of public education in traffic uppermost in our minds, let us look at both sides of the picture and in a most general way enumerate some of our difficulties. While I have listed here a few items, I have not put them down in order of priority of their importance.

A List of Traffic Difficulties

Lack of uniformity in almost every phase of traffic except right-hand driving, creating confusion to the driver, be he good or bad.

Lack of uniformity and adequacy in qualifying drivers. In one state where I have twice lived temporarily, a driver's license or operator's permit is not required.

Lack of regular or spot checks for the condition of equipment.

A multitude of combinations of speed and Stop and Go.

Lack of warning signals, especially by drivers.

Bad road situations left for long periods of time to the ingenuity of the driver to overcome.

A multiplicity of signals and signs subject to varying interpretations; these frequently include every form of inventive genius and human imagination. In many instances, they serve only to confound the best intentions of a good driver.

Inadequate facilities with a resultant overburdening of those available.

Parking—a most important traffic problem; much has been said about it but little has been suggested or done that is acceptable as a solution. The public deserves our sympathy. Parking congestion arises from many causes which cannot be predetermined, and for that reason no solution will be stable.

Economic considerations and rapidly changing conditions.

Rapid strides and phenomenal progress in all modes of auto transportation.

In all this may I say no one is to blame and there is no discredit to be laid at anyone's door. It is a part of our national growth, keeping pace with science and our eagerness to conquer time and distance.

You can **CLEAR THE WAY** far ahead of the screaming sirens by merely pressing a button on

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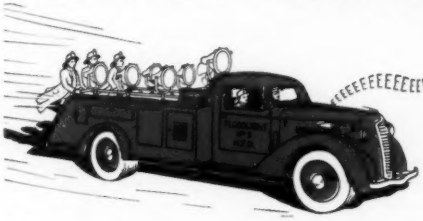
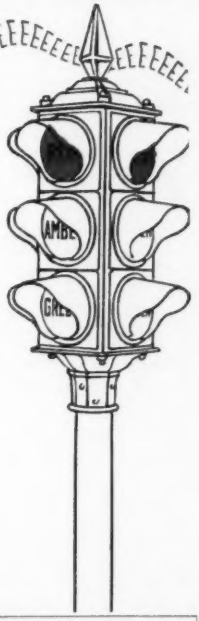
All-Red Control Cabinet



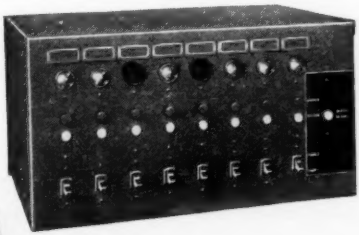


In case of fire or other emergency you can issue stop orders that will be instantly obeyed by hundreds of motorists blocks or even miles away by simply pressing a button on Crouse-Hinds All-Red Control Cabinet. Furthermore, you can issue such orders to any particular area of the city at will, because this remarkable control cabinet is actually a series of selector switches which permit the emergency indication to be placed on various groups of signals.

Each switch may control the signals on one particular street or in one particular area so traffic is only stopped where necessary and the normal traffic flow continues uninterrupted in all other sections of the city. Pilot lights show you which areas are on the all-red.

The all-red indication is automatically ended by a timing relay at the expiration of a pre-determined time.

The cabinet illustrated has separate switches for eight different groups of signals. This system of control is flexible and cabinets can be furnished to accommodate any number of circuits.



Crouse-Hinds Catalog 226 lists a complete line of traffic signals, beacons, flashers, and a series of controllers designed to help you solve your traffic control problems — from simple installations up to the most complex heavy traffic problem. Send for your copy.

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This recital sounds like we have no quiet afternoons or evenings at home. On the contrary, we have many and the wonders of automotive power and transportation have contributed to our enjoyment of them far away from congested areas. They have increased our sociability, our companionship, and our enjoyment of them, but along with these advantages have come additional traffic problems.

Automobile A Great Boon

The automobile has been a boon to our industrial growth in the production and the delivery of raw materials to the plants and again in the prompt delivery and wide distribution of the final product converted from those raw materials.

By daily or more frequent delivery to our doors, it has changed our daily diet, so much so that daily bread has only a figurative meaning.

On the fringe of our thickly settled areas, we have a mass movement of our population each morning and each evening of the working days of the week. These are the commuters who enjoy their work in the city and their life in the country.

Week-ends are a signal for a general exodus from the city to the country-side or the beach. They embody every mode of travel—every type of cargo and every rate of speed—they present every traffic hazard.

We have a seasonal movement away from the cares and frets of a livelihood to the beach or the mountains for a tan or recuperation.

And last, we have the heavy long hauls of freight or human cargo tearing down the thin white lines that magically keep the opposite rapidly moving columns from collision and disaster.

Provisions for our long distance and trans-continental travel leaves much to be desired. Great opportunities lie ahead of us in their development.

A Plea to Engineers

This is a slight picture of automobile traffic in our country without the undesirable conditions of parking. Together they constitute our traffic problem. Engineers may feel they have constructed the best roads that can be built. I think they have, and I have feebly tried to express my compliments to them, but let us hope that in their planning and anticipation of future needs and uses of the facilities that are built they will embody every aid that engineering skill can provide to assure the public a full measure of pleasure, a minimum of hazards and the assurance of safe and efficient travel.

This article is based upon a speech delivered before the American Road Builders' Association Highway Training Course, April 11, 1946.

—o—

DETROIT CONVERTING TO TRACKLESS TROLLEYS

Conversion of nearly all Detroit street car lines to trackless trolley coach and bus operation within the next few years was announced this week by Richard A. Sullivan, general manager of the Detroit Department of Street Railways.

Trackless trolley coaches will be used for the first time in Detroit and Sullivan estimated that between 200 and 300 coaches would be purchased at a cost of more than $3,500,000 to replace the present street cars. They will be used on four main downtown streets as well as on other runs.

The company now operates 908 street cars and all except one line will be replaced by new vehicles. New gas buses will also be purchased as a part of the new modernization plan.

Painting Pavement With Seven-League Boots

by M. A. BEBEE, *Member I.T.E.*
Traffic Engineer, Buffalo District
New York State Department of Public Works

IN ORDER to provide traffic control devices for the traveling public, we are sometimes confronted with problems of a magnitude and importance that require something like seven-league boots to cover the ground both expeditiously and efficiently.

Pavement marking, one of these problems, is no longer a theory. Controlling the lateral placement and direction of vehicles on the pavement is firmly established as the next step after providing a pavement surface for vehicles. It is the stage-setting for the movement of motor vehicles and as such is an important concern of the traffic engineer today.

In New York State, nearly 10,000 miles of pavement on the State system are painted and maintained each year. Since half of this mileage must be gone over twice, this means that about 15,000 miles of various types and widths of pavement are covered every year. We have, therefore, had to develop a form of the mythical seven-league boots to do the work in a practical and expeditious manner.

The New York Lane Line System

The primary consideration in developing a program for painting our pavements was the adoption of a system of marking which would be easily understood by the motorist and simple to paint and maintain. In the beginning, New York State investigated and adopted the all-white broken line system, with the solid line on the driver's side of the broken line to indicate the no-passing zones. The solid line was also adopted as the centerline for multiple-lane pavements, with the broken lines as lane divisions.

The effectiveness and popularity of the system was evidenced by the immediate and whole-hearted approval of the motorists. The white paint provided excellent visibility under all conditions of lighting and weather. It was a regulatory color, according to national standards, and as such was adopted as the legal color for indicating no-passing regulations established by the State Traffic Commission in locations where sight distance was less than 500 feet.

Advantages of Using Broken Line

There were two special advantages to the use of the broken line, particularly as centerlines on two-lane pavements. It permitted the painting of no-passing areas with the same effective white paint by using the solid line in the motorists lane, and at the same time, showed that passing was allowed near the ends of curves and beyond the crests of hills. The system was a matter of form or delineation, and did not depend on the use of a second color, and the sensitiveness of drivers to color, to be effective. This desirable feature was supplemented by a second advantage of a most practical nature.

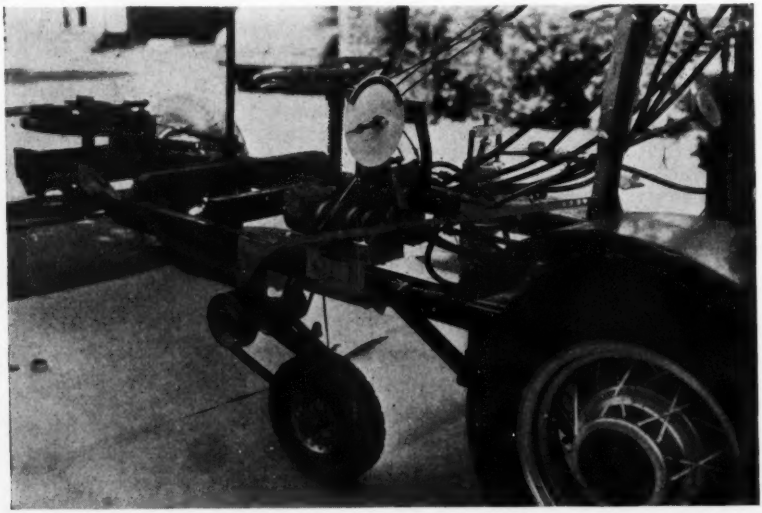
The economy and speed of painting that was possible with the broken line

method and the proper apparatus made the large pavement marking program on New York State highways a feasible undertaking. Since a large percentage of the pavements that are painted in New York State, as well as other states, are two lanes wide, their painting is directly reflected in the total amount of paint used. This is approximately 100,000 gallons for painting and repainting each year in New York State.

The use of solid stripes for centerlines on two-lane pavements and for lane lines would have nearly tripled the amount of paint used, and substantially increased the cost of labor because of filling and refilling the paint tanks three times as often. At present day prices, it is estimated the New York State all-white broken line system results in savings of from $300,000 to $350,000 each year. Savings of this nature help to make funds available for other traffic control measures and, depending on the size of painting programs, will do much to stretch the funds and increase the amount of service of traffic departments in other states and subdivisions now using solid multi-color marking systems.

Paint Machines

Early in our pavement marking program, it was evident the State would need fast, efficient machines, operating in each of the ten highway districts of the State, to paint the many miles of pavement in time for the spring and summer traffic peaks, and then repaint in the summer and fall. It was necessary to have machines on hand in every district for the regular program and to go back over the many stretches of pavement that were surfaced or patched with bituminous material. It is our policy to do this as soon as the surfaces will take the paint. Consequently, some of the districts need two machines at the peak of the pavement painting



Close up of the Pushmobile. Note steersman's seat and dial showing position of painting cams.

Reflective HIGHWAY STRIPING and *Reflective* SIGNS

ECONOMICAL — Prismo Life-Line lasts 3 to 5 times as long as ordinary traffic paint at a *saving* in cost to you.

— Reflectorize your signs with the Prismo Sign Kit at only $.06 to $.07 per square foot. Apply in your own sign shop — no additional equipment needed.

SAFE — By providing 24-hour service, you protect your motorists. The National Safety Program reports accidents on the increase. This is your way to *cooperate* with the Safety Program.

MODERN — The increased number of automobiles and the high driving speeds demand that our safety devices be modernized. *Reflective* highway striping and signs are a *must!!!*

EASY APPLICATION — Reflectorizing with Prismo fits in with your other basic operations.

— Prismo Life-Line is laid with any standard road striping machine, with the addition of a dispenser supplied by Prismo.

— Prismo Sign Kit is applied in your own shop with no additional equipment.

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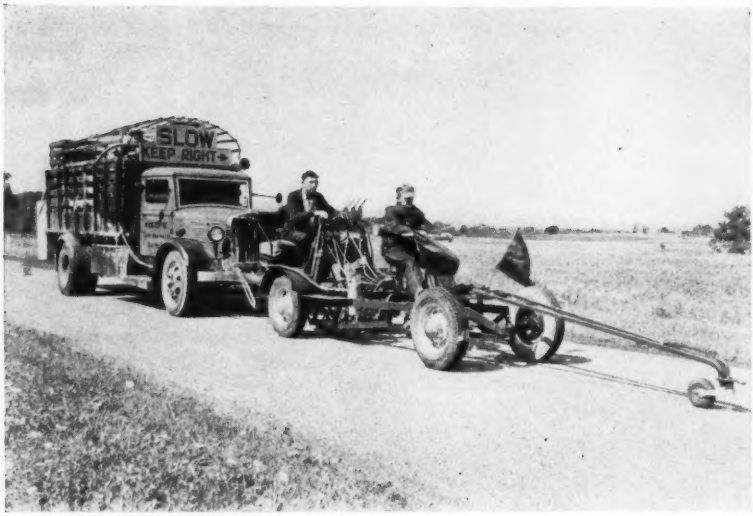


The Pushmobile in operation, with steersman and valve operator in action.

operations so the unpainted gaps, due to maintenance operations, can be closed.

Pavement painting machines of sufficient speed and flexibility to delineate the New York State markings were not on the market when the program was first considered. Speeds up to 15 miles per hour, and flexibility to put down and repaint the combinations of broken and solid lines in the no-passing zones, were necessary to do the painting on time and in the proper manner.

C. R. Waters, District Engineer in the Buffalo area, undertook the problem of furnishing suitable machines for this work. Under his direction, pavement marking machines, principally of the pushmobile type, were designed and manufactured for each of the ten districts.

The problem of duplicating the broken lines, which are 15-foot dashes of paint separated by 25-foot gaps, was solved after several variable drives and cam arrangements had been tried. A V-belt arrangement with a split pulley was devised to make fine adjustments in the length of the cycle, and a means of disengaging the painting cams and moving them forward or backward to the starting position (for the 15-foot dashes) was added to the machine. The position of the cams was indicated on a dial in front of the valve operator. These types of adjusting devices, and also electrically controlled devices, can be added to the high speed machines that are on the market today. They can be manufactured in highway machine shops for less than $500.00, which will be saved in painting a small mileage of broken line in place of solid line.

The Pushmobile

A typical New York State pavement painting outfit consists of a four-wheel pushmobile similar to the chassis of a light automobile, a three-ton truck equipped with a 60-cubic

foot air compressor, two 60-gallon paint tanks equipped with paint agitators, a small tank for cleaning fluid, a compartment for the wooden "bricks" to be dropped on the fresh paint line and the necessary hoses and auxiliary equipment. The pushmobile carries the controls and three spray guns with sled type baffles to control the width of line.

Steering the pushmobile is performed by guiding a boom with a small pneumatic-tired wheel, extending in front of the machine. A steersman gives his full attention to this one task. A valve operator is seated at the rear end of the pushmobile and controls the several combinations of broken and solid lines and the exact duplication of lines that are being repainted. He also controls the speed of painting which depends on temperature, type of pavement surface, and other variables, by signals to the truck driver. One man on the truck loads the paint from 5-gallon cans into the combination supply and agitator tanks. These cans are agitated by a platform shaking device before they are loaded on the truck. Another man sits on the rear step of the truck and places blocks on the painted line. Some districts use a light trailer for the blocks and place them on the painted line by sliding them down a metal chute.

A general view of the New York State equipment and the special devices used to paint and duplicate the lines accompanies this article. This fast, efficient equipment and the understandable but simple system of pavement marking in New York State are the seven-league boots we employ in discharging one of our most important traffic control functions.

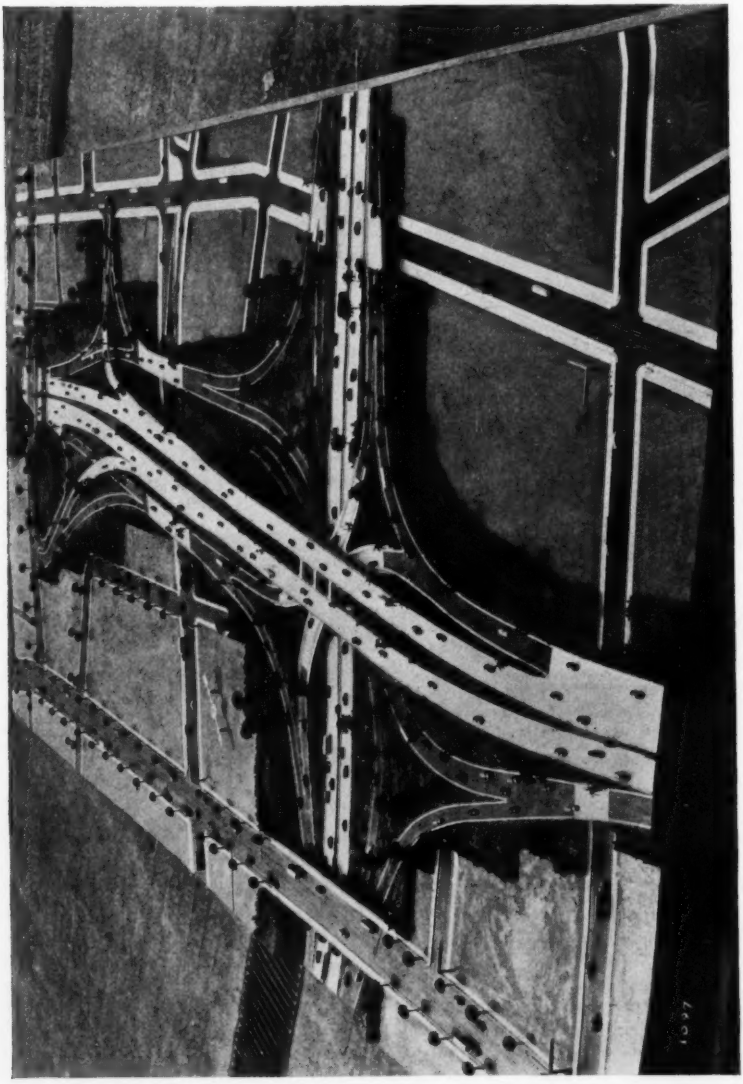
It is hoped that this article, and any additional information that may be requested, will point to a solution for states and subdivisions which are working on the problem of establishing complete pavement-marking programs.

The Hollywood Freeway Four-Level Interchange

by FRED GRUMM, *Assistant State Highway Engineer*
California Department of Public Works

THE TWO major freeways in Los Angeles are the Hollywood Parkway and the Harbor Parkway extension of the Arroyo Seco Freeway. Their intersection in an intensively developed area adjacent to Los Angeles Civic Center produced an unusually complex problem. Comprehensive traffic studies indicated an exceptionally high percentage of the heavy traffic volume to be served. A multiple bridge design was clearly indicated as the only one capable of adequately handling the traffic flow. On the other hand, the utilization of so large an area in this vicinity as would be required for conventional type of design of this nature seemed impractical.

Intensive study resulting from this dilemma finally lead to the evolution and adoption of a four level interchange in which all conflicting movements are separated in the vertical plane rather than in the horizontal plane by placing them on different levels. The principal feature of the



A model of the 4-level interchange.

design is the concentration of all of the separations involved into one structure. The effect is to reduce to a minimum the area required for the facility and the distance involved in traffic movement.

Right of Way Costs Saved

The relatively large structure cost is offset to a great extent by savings in right of way. The less tangible but nonetheless real benefits such as a minimum length of travel for vehicles involved in turning movements, direct and natural paths for all movements and adequate capacity in every segment are more than sufficient to complete the justification.

The large percentage of turning movements contemplated was a particularly impelling factor in influencing the adoption of this plan.

The radii employed in the design of the ramps are insufficient to permit turning movements at the design speed of the intersecting freeways but will allow velocities commensurate with maximum lane capacity. Thus while traffic executing turning movements may suffer a small loss of time because of a reduction in speed, no tendency toward congestion should result. It would have been possible to expand the plan to permit turning movements at a higher design speed but to have done so would have involved a larger right of way area without yielding commensurate benefits.

The cost of the four level structure itself will be about $1,100,000. Adjacent separation structures that would have been common to any design chosen add another $1,700,000.

A model of the 4-level interchange.

Safeguarding Workmen on Highways

by A. W. TURNER, *Safety Engineer*
Southern California Gas Company

THE TERRITORY in which our company operates extends from Avenal in the Kettleman Hills to Palm Springs. It includes such cities as Los Angeles, Burbank, Glendale, San Bernardino and Riverside, to mention a few. It includes thousands of miles of pipe laid along streets and highways, and thus the problem of protecting our workmen against traffic hazards is one of more than ordinary concern.

Some years ago we selected a yellow and black obstruction warning sign which we have standardized. In order to get motion to attract the eye we selected red flags, two of which are used on each important sign.

The standard sign mounting is a metal pipe upright with a rather wide base. This type of mounting was selected for two reasons: (1) to resist blowing over; and (2) to make sufficient noise upon their being upset to warn the workmen.

When excavations are made in a location where heavy traffic is a problem, it is the practice to park the truck against the oncoming traffic so that the workmen have the additional protection of the truck itself.

Since placing of the signs and the truck for maximum effectiveness may be varied according to the amount of traffic, the location of the job in the street, and on varying conditions such

as visibility, type of paving, etc., the foreman in charge is permitted considerable leeway in the exercise of his personal judgment.

The subject of job protection through effective use of the signs and proper parking of the truck has been discussed several times in the monthly safety meetings attended by all of the foremen. Out of these discussions came the fairly well standardized method of erecting signs and barricades which characterizes the company's jobs.

A Strange Experience

An example of the ingenuity exercised by a foreman was demonstrated on a job at First and Spring Streets, Los Angeles. It was necessary to excavate almost in the center of this very busy intersection at about 10:00 a.m. on a week day. The foreman was harassed by streetcar traffic and by automobile traffic from three directions. He therefore parked his truck to protect the job on the north and placed the pavement cuttings and the spoil on the south and east approaches. A sign also guarded the job on the three sides not protected by the truck.

One of the men was about chest deep in the hole when an automobile approaching from the street struck the sign and climbed over the spoil and the concrete blocks. Its momentum being gone, it then stopped, pinning the man lightly against the opposite side of the hole with the right front wheel against his back.

The man freed himself and climbed out of the ditch to discuss the situation with the driver of the car. When he opened the door he was shocked to find the driver dead. It was later determined that the driver had suffered a stroke and that the car had

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traveled some distance without being guided. The fact that the foreman so carefully planned his job protection very likely saved the workman's life.

Warning Sign Saves Injury

In another case a crew was working on a high-speed suburban road just at dusk. The foreman therefore placed his lead sign a considerable distance forward of the job to give maximum notice of the hazard ahead. One of the employees was preparing to climb into the back of the truck when a drunk driver hit the lead sign which skidded along the highway almost 100 feet. It then bounced off another sign and off the truck tire, slightly injuring the employee's leg. In this case also it is felt that the foresight of the foreman very likely prevented a serious injury.

In summary it may be said that the company provides the materials with which to do an effective sign-warning job (a minimum of five signs on each service truck), and recommends the procedure to be used except in those cases where the foreman feels greater safety will be gained by doing the job somewhat at variance with the customary method. In all cases the foreman is responsible for the placing of signs and the parking of the truck, and to his credit it may be said that he does a fine job.

—*September, 1946, California Safety News.*

Left Turn Accidents

by R. H. BALDOCK
State Highway Engineer of Salem, Oregon

THIS study was made to determine if there existed a relationship between accident frequencies and left-turn volumes—relative to the advisability of providing left-turn refuges on four-lane divided highways for small left-turn volumes. It was the belief of the Traffic Engineering Division that the infrequent left turn created as great, if not a greater hazard, than the frequent left turn. This was based purely upon supposition derived from personal observation. However, it was felt advisable to study the accident records over a period of years in order to determine through the use of factual data the actual experience. For the purpose of this study two four-lane divided highways were studied. The two highways studied were:

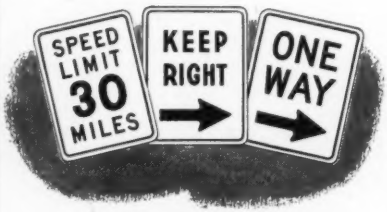
US99E — McLoughlin Boulevard—from the Portland city limits to the Oregon City city limits.

US99W—Interstate Avenue—within the City of Portland from N. Denver Ave. and N. Argyle St. to N. Russell St.

The first of these two highways is delineated through the use of a four-foot asphaltic medial strip with "jiggle bars" while the latter has a six-foot raised concrete medial island.

Source of Data

The accident records in the Traffic Engineering Division were used to the end that all accidents occurring on both of the sections studied were analyzed so that only those accidents caused by a left turn could be determined. These accidents are basically of two types, the first being the rear end caused by the vehicle making the left turn stopping in the moving lane of traffic and the second being a turning movement collision caused by the left turn striking or being struck by



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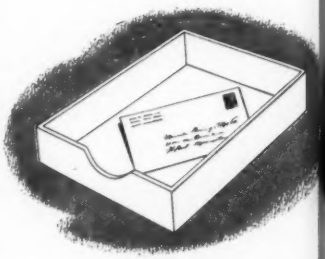

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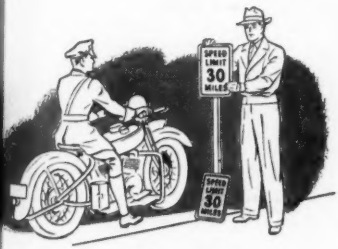

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the opposing through movement. In order to correlate these accident data with traffic volumes, traffic density counts previously made were analyzed and the number of left turns—leaving the highway—at every intersection were determined.

US99E—McLoughlin Boulevard—is 44 ft. wide with four 10-ft. traffic lanes and one 4-ft. medial divider with "jiggle bars." The pavement is of Portland cement concrete except the medial divider which is of asphaltic concrete. It has 10-ft. graveled shoulders and no provisions for acceleration, deceleration lanes or left-turn refuges. This highway has a through volume in either direction of approximately 3,000 vehicles per day with an average speed of approximately 40 mph. Some 25 intersecting roads were studied along this section of highway.

US99W—Interstate Avenue—is a 60-ft. street, curb to curb, with a 5-ft. raised medial divider, two 7.5-ft. parking lanes and four 10 ft. traffic lanes. No provision on this street is made for acceleration, deceleration lanes or left turn refuges. There are at the present time left-turn signals at the several signalized intersections and this type of control was given due weight in the analysis. This highway carries a through movement in either direction of approximately 5,000 vehicles per day with an average speed of approximately 22 mph. The entire paved section and the raised medial divider are built of Portland cement concrete.

Accident records on US99E were for a period of seven years (1938-1944, inclusive) and an average year of the seven years was used for this study. The traffic density data were as of 1941. US99W had a shorter sample of accident data, being for a four-year period (1941-1944, inclusive) with an average year of the four years

VEHICLE ACCIDENTS CAUSED BY LEFT TURNS ON 4-LANE DIVIDED HIGHWAYS

By Oregon State Highway Department, Traffic Engineering Division, November, 1945

Traffic Volume Group	RURAL HIGHWAY SECTION			URBAN HIGHWAY SECTION			COMPOSITE HIGHWAY SECTION		
	Left Turn Volume V_L	Accidents A_L	Frequency Index F	Left Turn Volume V_L	Accidents A_L	Frequency Index F	Left Turn Volume V_L	Accidents A_L	Frequency Index F
0— 49	15	0.6	0.040	28	1.0	0.036	18	0.7	0.039
50— 99	78	1.5	0.019	66	0.3	0.005	72	0.9	0.013
100—199	150	2.0	0.013	135	1.2	0.009	139	1.4	0.010
200—299	207	2.0	0.010	288	0	0	248	1.0	0.004
300—399	.....	.....	.....	385	4.7	0.012	385	4.7	0.012
400—499	.....	.....	.....	487	3.0	0.006	487	3.0	0.006
500 & over	1,464	4.0	0.003	1,364	3.7	0.003	1,389	4.5	0.003

V_L=Average left turn volume per day.
A_L=Accidents per year caused by left turns.
F=Frequency Index—frequency of accidents per year caused by one left turn per day (when made for one year).

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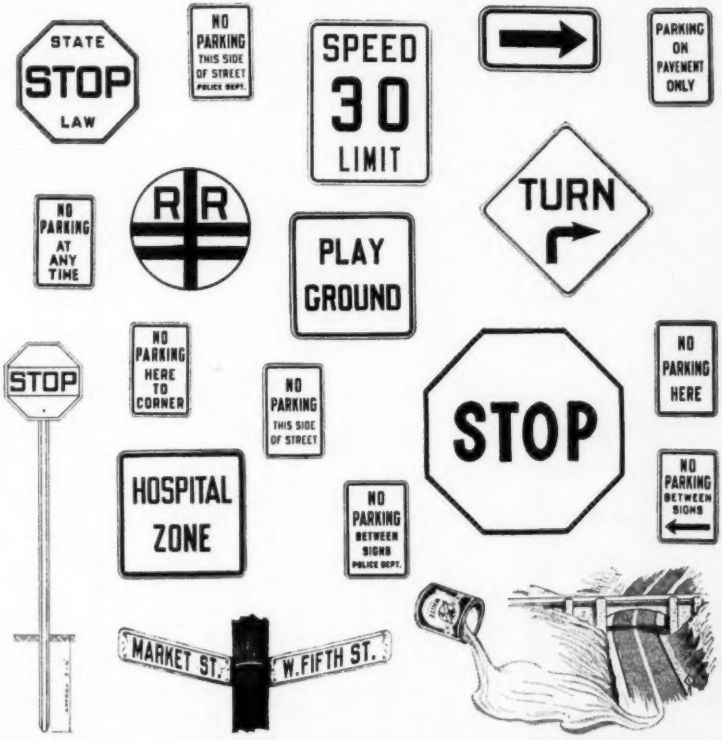

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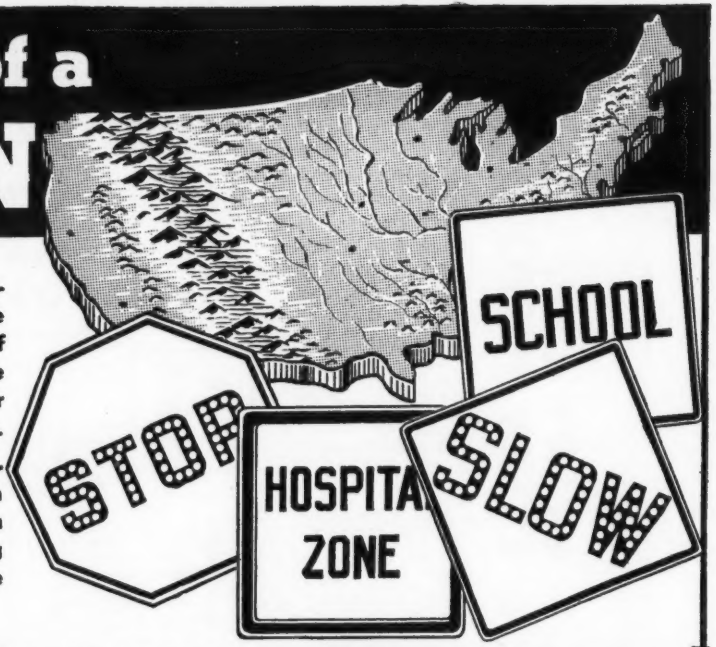

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being used in this study. The traffic density data in this case were also put on a 1941 base.

Analysis

As mentioned hereinbefore, all accidents occurring on the two sections of highway studied were analyzed and only those accidents which were caused directly or indirectly by a left-turn movement—leaving the highway—were considered. Tabulations for the several intersecting roads and streets were prepared whereby the number of accidents caused by left turn movements were coupled with the number of vehicles making this left turn. These data were brought together within the several left-turn volume groups and were reduced to an average intersection for each of the several groups.

In order to correlate those data the following formula was evolved:

$$F_A = \frac{A_L}{V_L} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

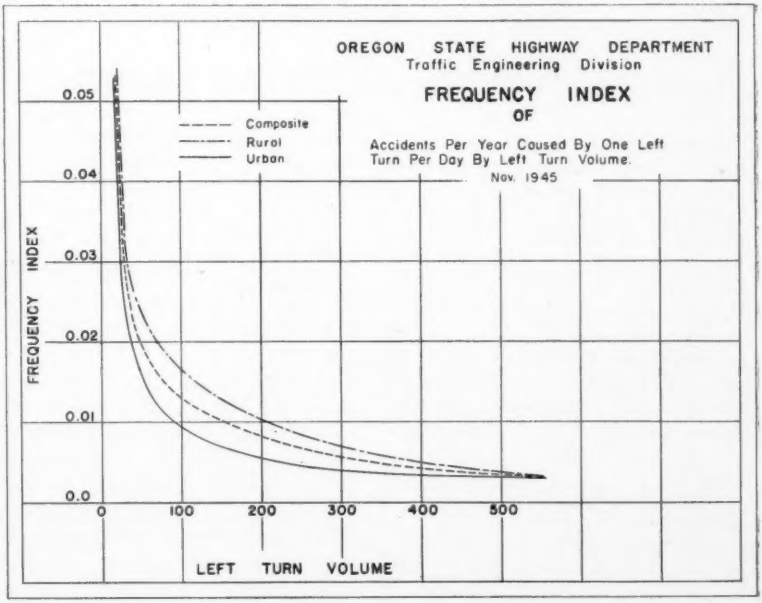
where

V_L = Average left-turn volume per day

A_L = Accidents per year caused by left turns

F = Frequency Index — frequency of accidents per year caused by one left turn per day (when made for one year)

The frequency index, which is the frequency of accidents per year caused by one left turn per day (when made for one year), was determined so that a relationship between the several freqencies within the various volume groups would be known. A recapitulation of the basic data through the use of the foregoing formula is contained in the table shown. These data



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are also plotted on the graph (page 77).

The sample studied was not large enough to cover all of the several volume groups for the rural section but the data in the other volume groups were adequate.

This preliminary analysis shows a definite trend in that the smaller the left-turn volume (VL) the higher the frequency index (F). This was true for the urban section, the rural section, and the composite section. It is to be noted that the rural index is somewhat higher than the urban index and this is no doubt occasioned by the fact that the through volume was smaller and that the speed was higher. However, the difference between the urban and rural indices is so small that there is basically no variance.

Conclusions

This analysis brought out that the frequency of accidents decreases as the number of left turns increases. That is to say, a frequency of 0.39 accidents per year is occasioned by one left turn per day (when made for one year) and in the latter volume group, 0.49 and decreases hyperbolically to a minimum of 0.003 accidents per year for one left turn per day in the left-turn volume group of 500 and over. Stated in a different manner, in the first volume group, 0-49, one accident per year may be expected for every 26 left turns per day (when made for one year and in the latter volume group, 500 and over, one accident per year may be expected for every 333 left turns per day.

These data show that the infrequent left turns, when the through volume and speed are consistent throughout a section of highway, cause accidents in a greater frequency than do the frequent left-turn movements. This is a result of the surprise element that the occasional left-turn creates.

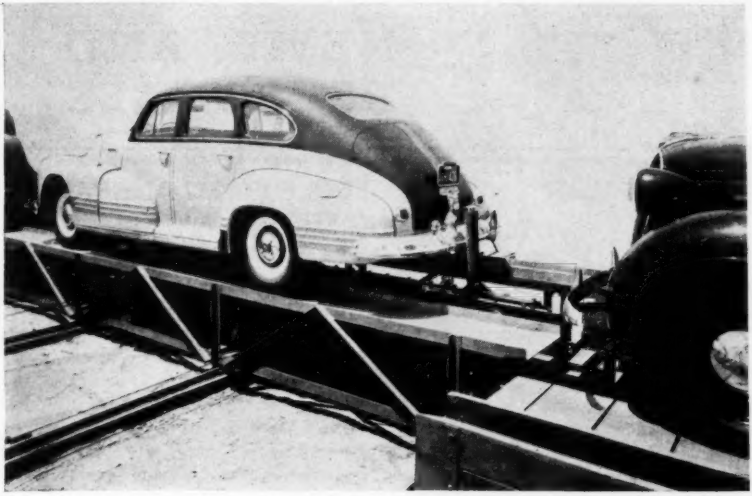
—Reprinted from Roads and Streets Magazine, August 1946.

AUTOMATIC PARKING DEVICE NOW AVAILABLE

Drastic savings to auto park operators in space, handling and building construction are claimed by the manufacturers of a revolutionary new, fully automatic parking device now being demonstrated in Los Angeles. Marketed under the trade name of Park-O-Mat, this device completely eliminates handling and driving cars either by the garage attendant or car owner, and makes highly profitable use of narrow lots in congested areas that cannot be utilized for parking at the present time.

Merely at the press of a button on the master control board located near the entrance of the garage, the car is automatically parked in any part of the building. A simply constructed mechanism grips the bumpers of any type or make of automobile and slides it to an elevator. On reaching the desired level, the elevator automatically stops and the car slides into an individual stall, the whole process averaging less than a minute. On pressing another button, the procedure is reversed and the car returns to the entrance.

As pointed out by the manufacturer, the Park-O-Mat not only permits the garage owner to reduce the number of his attendants to a fraction of that required by ordinary parking methods, but is so simple and automatic that anyone can operate it. Furthermore, the type of construction is remarkably inexpensive and its



This shows car on transfer table or elevator where it has been automatically rolled. The electrically operated car positioner is automatically returned for the next car. The car is automatically put into a stall from the elevator or transfer table.

height limited only by local ordinance restrictions, a feature that multiplies the profits obtainable from any piece of property.

The elimination of switching, shuttling and shifting cars presents attractive advantages to the customer as well, the manufacturer says. Since the auto is never operated under its own power from the time it leaves the entrance until it returns, its doors may be locked to protect valuables inside and unsightly fender and body scratches are entirely avoided.

According to its manufacturer, the Park-O-Mat equipment is now being readied for production. Further details may be obtained by writing Park-O-Mat, Inc., 3855 Wilshire Boulevard, Los Angeles 5, California.

British Study Rules For Road Signs

The standardization of road signs to be black on a white background and the removal of unauthorized traffic signs were among the recommendations made by the British Departmental Committee on Traffic Signs in a recent report. These suggestions have been passed on to highway officials in England, Scotland, and Wales for their consideration.

Other attempts at uniformity were made through suggestions to invert the triangle in "Slow" and "Halt" signs; to place warning signs on open roads not less than 150 yards in advance of the places to which they apply; and to provide depth gages at fords on public roads.

The report also made other recommendations, particularly disapproving illuminated advertising signs placed in positions where they may distract the attention of the driver from traffic signs or may be mistaken for them.—*American Standards Assn.*

ITE NEWS AND PERSONALS

INVITATIONS NOW IN ORDER FOR 1947 ANNUAL MEETING SITE

The Board of Direction of the Institute of Traffic Engineers will decide early in December where the next annual meeting of the Institute is to be held.

Guy Kelcey, 120 Broadway, New York City, is Chairman of the Committee to investigate appropriate cities in which to meet next year and to make recommendations to the Board. The Institute has already received an invitation to return to Columbus. Another invitation, inspired by the Traffic Engineers of that area, appears to be in the making from Detroit, Baltimore and several other cities.

Guy Kelcey urges members who may want the Institute's next annual meeting in their cities to please investigate local facilities and advise the Committee. While the Institute distinctly does not have its hand out or its cap in its hand, it is important that invitations include a statement of what facilities can be provided for our meeting of 1947, and about what dates suitable accommodations can be provided.

PERSONAL ITEMS

Lt. Col. William A. Stancer (Assoc. I.T.E.), Corps of Engineers, has reverted to an inactive status and assumed his former position as Chief Engineer, Dept. of Transportation, State of Washington.

Taylor Lewis (Member I.T.E.), has accepted a position as assistant professor with the Civil Engineering Department at Cornell University, Ithaca, N. Y. One of his first jobs is to organize a class in Traffic Engineering. He was formerly on the staff at the Yale University Bureau of Highway Traffic.

Harold F. Hammond (Member I.T.E.), has been employed by the City of Wilmington, Delaware, to make a complete parking survey of the business district. Edwin Koester (Mem. I.T.E.), Wilmington City Traffic Engineer, is cooperating in the project.

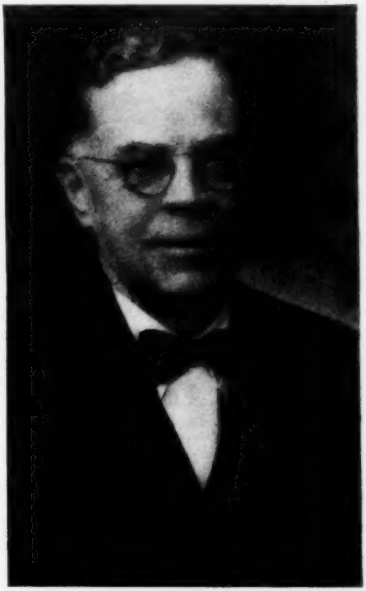
Institute Honors Charles Tilden

Charles J. Tilden was accorded the distinction of being elevated from grade of Member to Honorary Member of the Institute of Traffic Engineers according to action taken at the Annual Meeting of the Institute in Columbus last month. He becomes the fourth man in the Institute's history to be thus honored. Other honorary members are William Phelps Eno (deceased), Thomas MacDonald and Paul G. Hoffman.

The Institute has sought this way of expressing the heartfelt admiration

for and gratitude to one of its charter members who has contributed magnificently toward the advancement of the entire profession.

Charles J. Tilden's interest in traffic problems dates back to the New York Rapid Transit Commission about 1899, when he was an Assistant Engineer on the first New York subway, under General William Barclay Parsons, Chief Engineer. Then followed a long period of university work on the Engineering faculties of Cornell, University of Michigan, Johns Hopkins, and Yale. Shortly after joining the Yale faculty in 1919 he became an engineering adviser to the Federal Bureau of Public Roads, now the Public Roads Administration, and spent a number of vacation periods in Washington. Problems of highway traffic control and regulation were becoming increasingly insistent, and on the occasion of the formation of the Institute of Traffic Engineers he became one of its charter members.



Develops Pavement Letter Design

The development of highway signs to regulate traffic had reached an active stage in the late 1920's. Among these were the admonitions painted directly on the pavement, right in the path of the advancing motorist. Ordinary letters, so used, however, were so foreshortened by the flat angle at which they are viewed by the driver that they were sometimes illegible until the driver was practically on top of them. This is rather late for an admonitory sign, and, ordinarily the driver's vision is focused fifteen or twenty yards, or more, ahead of his car and not on the pavement only a dozen feet ahead. This situation seemed to call for a design of letters greatly elongated as painted on the pavement, with thickened horizontal lines so as to be readable when viewed at the very flat angle by an approaching motorist. Mr. Tilden designed a series of such letters which were published in "Civil Engineering," November, 1931. It is interesting to record that these letters have been widely used in this country and have been noted on city streets in Australia and New Zealand.

Developed Speed Detector

One of the serious problems in connection with traffic control is that of speed. Maximum speed or "speed limit" plays an important part in regulatory ordinances and laws. The only way to determine the speed of an automobile was by means of the speedometer attached to the car and read by the driver or a passenger. It was obvious that if we were to secure authoritative and dependable information with regard to vehicular traffic on our trunk highways, such speeds should be determined from outside the vehicle and without the knowledge of the driver. A simple

but effective instrument for this purpose (an arrangement of mirrors to eliminate parallax), using a measured base-line at the roadside and a stopwatch, was devised by Mr. Tilden in 1935, and used to measure the speeds of upwards of 90,000 vehicles on Connecticut highways. The results of this study were published in a special bulletin, "Motor Vehicle Speeds on Connecticut Highways," in 1935. Since then the method has been used in other localities, adding materially to our knowledge of the habits of motorists in the matter of the rate at which they travel under varying conditions.

The Yale Traffic Bureau

In 1938 the Bureau for Street Traffic Research, now known as the Bureau of Highway Traffic, which had been established a few years previously by Dr. Miller McClintock, was seeking a new home. Mr. Tilden was then Chairman of the Committee on Transportation at Yale and was able to arrange satisfactory office space, class rooms, and laboratory facilities for the Bureau in the new Strathcona Hall. The Bureau moved in to its new quarters that fall and has since carried on its activities there.

Mr. Tilden was appointed by Governor Cross to the first Commission on Street and Highway Safety in 1936 and was reappointed by Governor Baldwin. He served until the fall of 1942 when war service took him to New Jersey for duty (civilian) with the Signal Corps, U.S. Army. From that post he went to Australia where he worked for the Office of War Information in the U.S. Library in Sydney. He returned to the United States a few months ago.

Mr. Tilden is a director of the Connecticut Company, in which capacity he is in close touch with bus and streetcar operations.

MEMBERSHIP ELECTIONS

The following men were elected to membership in the INSTITUTE at the October 3rd meeting of the Board of Direction in Columbus, Ohio, as indicated:

NEW MEMBERS

Mr. Ralph Sprungman
Traffic Engineer
City Engrs. Dept.
Minneapolis, Minnesota

Mr. George H. Herrold
Managing Director & Planning Engr.
City Planning Board
St. Paul, Minnesota

Mr. George K. Houghtailing
Chief Planning Engr. & Exec. Secy.
City Planning Commission
Honolulu, Hawaii

Mr. Harold G. Bauerle
Traffic Design Engineer
Michigan State Highway
Lansing 12, Michigan

NEW ASSOCIATES

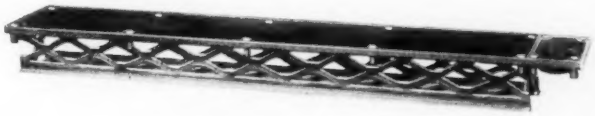
Mr. J. Cal Callahan
Traffic & Transp. Engineer
Morris Knowles Inc.
1312 Park Bldg., Pittsburgh 22, Pa.

Mr. Albert C. Sherman
Hwy. Planning Engineer III
Planning & Traffic Division
Michigan State Hwy. Dept.
Lansing, Michigan

Mr. James P. Murphy
Consulting Engineer
Crawford, Murphy & Tilly
402 E. Adams St., Springfield, Ill.

Mr. William Marston
Traffic Engineer
Chicago Surface Lines
Chicago, Illinois

ELECTRO-MATIC PRESSURE-SENSITIVE VEHICLE DETECTORS



Electro-matic pressure-sensitive detectors are used in traffic-actuated control systems, toll stations, automatic door openers, and wherever reliable vehicle detectors are required.

These detectors are highly resistant to traffic wear and the elements. The contact units are replaceable in the steel frames.

The following sizes and types are available:

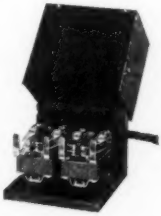
4′ Type HR Non-Directional

6′ Type HR Non-Directional

8′ Hype HR Non-Directional

6′ Type HRD Directional

8′ Type HRD Directional



Directional operation is obtained when the DR-5 Directional Relay unit is used in conjunction with the directional detector.

Write for new booklet
"The Challenge of the Intersection."

AUTOMATIC SIGNAL CORPORATION

NORWALK, CONN. CHICAGO, ILL.

Mr. Robert E. Dunn
Asst. Traffic Engineer
State of Washington Dept. of Hwys.
Olympia, Washington

Mr. Eugene Maier
Consulting Engineer
Staley & Maier
6125 Fordham St., Houston 5, Texas

Mr. William J. Miller, Jr.
Div. Traffic Engr.
Delaware State Hwy. Dept.
Wilmington, Delaware

Mr. Warren T. Adams
Research Engineer
Capital Transit Company
Washington, D. C.

Mr. Frank A. Ronan
Sr. Asst. Traff. Engr.
Traffic Engineering Bureau
429 Wayne St., Detroit, Mich.

Mr. Earl M. Plettner
Asst. Supt. of Transportation
Milwaukee Elec. Ry. & Transp. Co.
940 W. St. Paul Ave.
Milwaukee 3, Wisc.

Mr. Benjamin H. Bowman
Div. Traff. Engr.
State Hwy. Dept.
Columbus, Ohio

Mr. John A. Swanson
District Plann. & Programming Engr.
Public Roads Administration
St. Paul, Minnesota

NEW JUNIOR

Mr. Paul Plutae
Asst. Traffic Engineer
Arizona Hwy. Dept.
Phoenix, Arizona

TRANSFER IN GRADE

Mr. Theodore M. Vanderstempel — from Associate to MEMBER
Mr. Harold L. Frier—from Junior to MEMBER
Mr. Simon M. Lutz, Jr.—from Junior to ASSOCIATE

LOOKING AHEAD

INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION CONFERENCE, Nov. 11-14, Miami, Florida.

AMERICAN MUNICIPAL ASSOCIATION CONFERENCE, Nov. 17-20, Chicago, Illinois.

AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS annual meeting, Nov. 19-21, Hotel Fairmont, San Francisco.

Washington, D. C. Section Schedules Meetings

The following is the tentative schedule for the meetings of the Washington section. All Institute Members who may be in the vicinity at the time are invited to attend.

October 23, 1946
November 20, 1946
December 18, 1946
January 29, 1947
February 26, 1947
March 26, 1947
April 23, 1947
May 21, 1947
June 18, 1947

Annual Meeting Highway Research Board

The Annual Meeting of the Highway Research Board will be held in Washington, D. C. from December 5-8, 1946. All members of the Institute of Traffic Engineers are cordially invited to attend.

Topics on the program in which

traffic engineers will be particularly interested include:

Thursday — December 5

Morning

Report of Committee on Origin and Destination Surveys—D. Grant Mickle, Chairman.

Manual on Origin and Destination Surveys—Committee Report.

Origin and Destination Survey Methods as Applied to the Transportation Study—Baltimore Metropolitan Area—William F. Childs.

Purpose, Analysis and Application of the Origin and Destination Survey in Milwaukee—R. W. Gamble and Howard Ilgner.

Use of Origin and Destination Survey Data in Development of the Highway Plan for Fort Wayne, Indiana—R. M. Brown.

Evening

Report of Committee on Parking—T. M. Matson, Chairman.

Summary of the Methods and Problems of the Providence Parking Investigation—Lester P. Manning.

Summary of Legislation Dealing with Parking Facilities—David R. Levin.

Parking Study Procedures and Conclusions with the City of Pittsburgh—Donald M. McNeil.

Friday — December 6

Morning

Method for Recording Lateral Position of Vehicles—F. H. Green.

Some Criteria for Scheduling Mechanical Traffic Counts—Boris B. Petroff.

Control of Highway Access—F. Bruce Crandall.

Toll Bridge Influence on Highway Traffic—M. Earl Campbell.

Afternoon

Report of Joint Committee on Uses of Highway Planning Survey Data—G. G. Edwards and G. P. St. Clair, Joint Chairmen; Thomas B. Dimmick, Secretary.

Highway Finance and Taxation—Charles M. Noble.

Programming and Planning—R. E. Jorgensen.

Urban Problems—J. Carl McMonagle.

Saturday — December 7

Afternoon

Report of Committee on Highway Capacity—O. K. Normann.

Problems Created in Highway and Driveway Design by New Car Clearances—Charles P. Eveland.

Discussion on Highway Capacity.

Application of Statistical Sampling Methods to Traffic Performance at Intersections—Bruce D. Greenshields.

LETTERS TO THE EDITOR

Dear Editor:

Well! The 17th Annual Meeting has passed into History. As the tumult and the shouting subsided, as the cohorts dispersed to their scattered abodes, leaving the headquarters in 1337 to gather dust or to entertain some less worthy delegates, the concensus of opinion was that the INSTITUTE'S first venture in holding an independent convention had been such a grand success that henceforth no thought of combination with other organizations should be considered.

While we shall all treasure its memories, the only tangible record of its many accomplishments will ultimately be the papers embalmed for posterity in the PROCEEDINGS. As these have been entrusted to the tender mercies of the Editor, a startling change in the trend of thought of Traffic Engineers has been revealed, in comparison with the issues of recent years.

Naturally in 1942 the emphasis was

on the military application of traffic techniques to the prosecution of the war effort, both abroad and at home. Then in 1943, while this objective was still in mind, there began to appear some glimmer of planning for the anticipated termination of hostilities. This blossomed out in 1944 into elaborate schemes for express thruways everywhere, a trend that was further amplified in 1945, with only an occasional thought as to the terminal facilities needed to accommodate the flood of traffic which would undoubtedly ensue.

BUT in 1946 the flood is already upon us, without waiting for the building of these inviting highways, nor the replacement of our old jalopies with promised new cars. So almost all of the sessions of the INSTITUTE Meeting were devoted to discussions of what we desperate Traffic Engineers might do *right now* to keep our business centers from congealing immobilization thru traffic congestion. It is a challenging crisis; parking in all its troublesome aspects was the theme-song, to the exclusion of almost every other topic. The disconcerting fact was only too evident that our gorgeous plans for an ideal post-war era surely intensify our difficulties, unless we could promptly produce an adequate answer to the question, WHERE CAN WE PARK THEM *NOW*?

Yours truly

William Powell (Mem. ITE)
Editor, ITE Proceedings
ITE Historian
Buffalo, N. Y.

Dear Sir:

The writer would be thankful if you would find room in your publication for the following suggestion:

To alleviate the traffic congestion in downtown sections one may consider the application of a new rule.

So far, a green light entitled a driver to proceed. There may be enough room on the other side of the crossing or the driver may be forced to stop in the middle of the intersection.

If there is no room for him on the other side of the crossing he will become a great and unnecessary obstacle for the traffic moving in the perpendicular directions.

To avoid this blocking—which will have a cumulative effect on all traffic in the district—the rules should be changed from "Proceed on Green" to "Proceed on Green only if there is enough space for your car on the destination-side of the crossing."

A person actually observing and studying traffic jams will be convinced in a short time of the beneficial effects which the observance of the rule of the "empty spaces" would have.

Very truly yours,

Gerhard Levin,
250 West 85th St.,
New York 24, N. Y.

N.U.T.I. Announces New Training Course

A basic 100-hour traffic training course for city, county and state police and highway patrol officers will be given November 4-22 at Northwestern University Traffic Institute, Evanston, Illinois. Instructors will include staff members of the Traffic Institute and the International Association of Chiefs of Police, Northwestern University faculty members, police and other traffic officials and representatives of leading safety organizations. Subjects will cover accident investigation, records, enforcement, traffic flow regulation, traffic engineering, law, vehicles, driver licensing, public relations, etc.

There is No Substitute for STIMSONITE *Reflectors*

1. Complete line of reflecting signs for traffic and highway:

STOP SIGNS AND PANELS
SYMBOL SIGNS
CAUTION SIGNS
ALPHABETS FOR SIGNS
SIGNALS AND MARKERS
HIGHWAY DELINEATORS
AIRPORT DELINEATORS
PLASTIC REFLECTORS FOR SIGNS

2. Non-reflecting traffic signs — standard, semi-standard and special.

3. Sign mounting accessories.

CATALOGUE ON REQUEST

50,000,000
STIMSONITE **REFLECTORS IN SERVICE**

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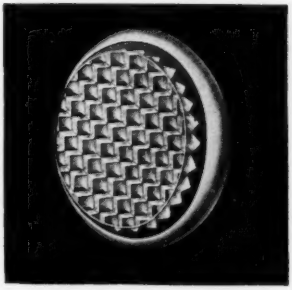
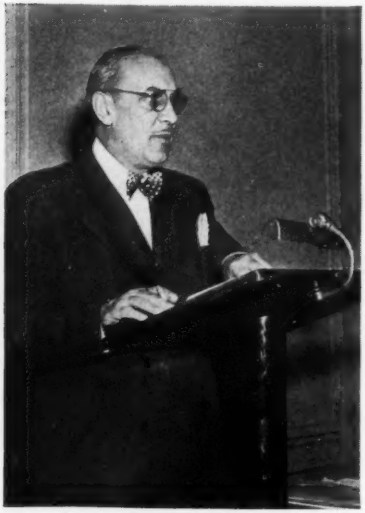
SIGNAL SERVICE CORPORATION
1027 NEWARK AVENUE, ELIZABETH 3, N. J.



STIMSONITE plastic reflector button —shallow-type or with deep housing. Superior to ordinary buttons in candlepower, uniformity of light output, angular acceptance of light and longer life expectancy.

Traffic Baton for night traffic direction. The light-barrel holds 18 11/16-inch *Stimsonite* yellow plastic reflector buttons. Used by State, County and Municipal Police Departments for radio and squad cars. Also by fire and water departments and public utility crews.



Leslie J. Sorenson (Mem. I.T.E.) addressing Traffic Session at National Safety Congress last month. See October issue for summary of Traffic Sessions.

MacDonald Receives Medal of Merit

President Truman has awarded the Medal of Merit to Commissioner Thomas H. MacDonald (Hon. Mem., I.T.E.) of the U. S. Public Roads Administration in recognition of his wartime highway work.

The citation pointed to Mr. MacDonald's long program for development of 78,800 miles of strategic military routes in the United States; to his leadership in mobilizing state and local highway agencies for special wartime services; and to his vast access-road program to serve war plants, raw materials sources and military installations.

Mr. MacDonald, who has headed Public Roads since 1919, holds the Cross of the Legion of Honor from the French Government, was made Knight of the Order of St. Olav by the King of Norway, and has been decorated by several other nations for his contributions to world-wide highway progress.

ATLANTA UTILIZES THEATER LOTS

Atlanta's new Park-Ride service provides spacious parking lots, capable of holding 800 automobiles, outside the congested downtown area, yet conveniently located at a point were frequent city transportation is available. Motorists from residential areas may drive their cars into the Fox theater lots and for a single charge of 35 cents enjoy safe parking for their cars and round-trip transportation to town on the city's transit system.

The service thus fulfills a two-fold purpose. Commuters can park in a relatively uncrowded area about a mile and a half from the center of the city and then ride transit vehicles to town. At the same time, the number of privately owned vehicles entering the congested area is reduced.

Shoppers Bus Line

Patrons who pay the 35-cent charge for parking and transportation receive two tickets good for a round-trip to town. The area in the immediate vicinity of the parking lots is served by at least a half dozen bus and trolley lines, any one of which may be used for transportation to and from town. In addition one Shoppers' Bus line is routed right through the parking lots.

The service is available from 8 a. m. to 6 p. m. Monday through Saturday. After 6 p. m. and all day Sunday the lots are reserved for the use of Fox theater patrons.—*Passenger Transport.*

WHY GROTE SIGNS?

HERE'S 5 GOOD REASONS WHY YOU SHOULD SPECIFY GROTE TRAFFIC CONTROL SIGNS

1 **Grote Signs are always Legible,** using only the newest U. S. approved lettering that commands drivers' attention. Grote Snaplock reflector buttons give you reflection of the **Warning Message,** making drivers familiar with traffic or road conditions in sufficient time to take the necessary precautions for safe driving!

2 **The New Grote Snaplock Plastic reflector button** permits replacement of individual buttons, without **removing** the sign rear housing, or the sign from its stationary post. **NO OTHER REFLECTOR CAN** give you this reflective quality, this easy installation and maintenance of signs, and the economy effected by using these Grote Snaplock Reflector Buttons.

3 **EXPERIENCE** has shown that **ANY PERMANENT TYPE REFLECTORIZED SIGN** must carry a rear housing plate to protect the reflectors, and the sign from being twisted and bent through vandalism. Rear housing plates are your assurance, that your signs will remain in place. Vandalism on a sign equipped with Grote reflector buttons, can be repaired **on the spot.**

4 A Grote reflectorized sign resists being twisted or bent so consequently you are assured your Grote traffic signs will give your motorists the **full day and night protection,** you can depend upon. This must be considered where human lives are at stake, and officials desire the maximum safety precautions on your highways.

5 The Grote Snaplock Reflector button is a revolutionary idea, giving you BETTER REFLECTION, EASIER INSTALLATION, AND MORE ECONOMICAL MAINTENANCE—all of those essential factors to good protective highway sign equipment. To insure the safety of your motorists, **SPECIFY GROTE SNAPLOCK REFLECTORIZED TRAFFIC SIGNS.**

Write, wire or phone today, for your sample Grote Snaplock Reflector Button.

THE GROTE MANUFACTURING COMPANY, INC.

BELLEVUE, KENTUCKY, OPPOSITE CINCINNATI, OHIO

(FORMERLY THE NATIONAL COLORTYPE CO.)

The Editor and Staff of TRAFFIC ENGINEERING want to wish our readers a most happy Thanksgiving Season.

SMALL CITY BUILDS 800-CAR GARAGE WITH 20-YEAR REVENUE BONDS

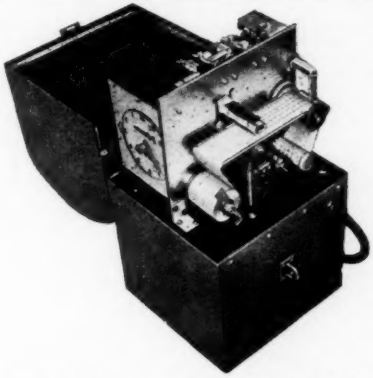
A half-mile above sea-level, up in the famed Pocahontas coal country, there is soon to be a parking garage capable of holding 800 cars at one time. A parking facility of that size is one the largest of cities would be proud to have—yet this garage is to be in Bluefield, W. Va., a city of 25,000 inhabitants.

Bluefield, located on the side of a valley, has practically no flat land, and very little vacant space where parking needs are greatest. Being the center of a 50-mile trading radius embracing 300,000 people, Bluefield has a parking problem of the first water. For some years the need for a large parking garage was apparent. Recently, backed by merchant and public opinion, the city, recognizing the permanency of parking needs, took the bull by the horns.

The city bought 46,600 square feet of land at a strategic spot, paying $114,000 for it. A construction contract in the sum of $397,500 has been awarded for erection of an open-deck garage of four parking floors—of a capacity sufficient to handle a line of cars three miles long.

Bluefield looks upon the project as a sound investment, both financially and business-wise. It's a self-liquidating facility, with revenue bonds financing the entire project, including land and construction. The tentative plan of operation and schedule of parking charges would pay for the project in 20 years, with a sizable surplus. Contemplated rates are 10 cents each for the first two hours and a day rate of 35 cents. Space on the first floor probably will be leased to private operators for car servicing.

Excavation of 25,000 cubic yards of earth has been completed, and heavy construction will proceed in all but the coldest weather. The garage will be in use late in 1947. — *Automotive Safety Foundation.*



STATE ENGINEERS
PLAN FUTURE ROADS WITH

Traficounter

State highway engineers, the original users of Traficounters, have this to say about the value of these precision built instruments in their highway planning.

1. "Our portable traffic recorders are used periodically for traffic counts on urban streets and for determining changes in traffic at scattered points on our rural highways."

2. "Mechanical counting equipment supplies most of the traffic information gathered."

3. "In every case (of planning for new roads and improvement of old roads) the value of traffic plays a very important part in determining the extent of such work and mechanical counting equipment has been found to be essential in economically gathering such data."

The Trafficounter is twice as fast as any other counter of motor traffic; essentially an electric counter which records the over-lapping cars as they cross the detector. It assures accuracy, is on the job 24 hours a day, and will save many man hours. **Streeter-Amet Company**, 1726 Belle Plaine Avenue, Chicago 13, Illinois.

STREETER-AMET

When writing to advertisers, please mention TRAFFIC ENGINEERING

"HORSE-AND BUGGY" STREET LIGHTS CITED

Evidence of growing recognition that present-day street lighting is as outmoded as the horse and buggy, in coping with modern traffic, is contained in the 1946 edition of "Accident Facts" just published by the National Safety Council, according to The Street and Traffic Safety Lighting Bureau, 1111 Terminal Tower, Cleveland, Ohio.

The new traffic death report states that 2½ times as many pedestrians are killed in the first three hours after sunset as in the three hours immediately preceding.

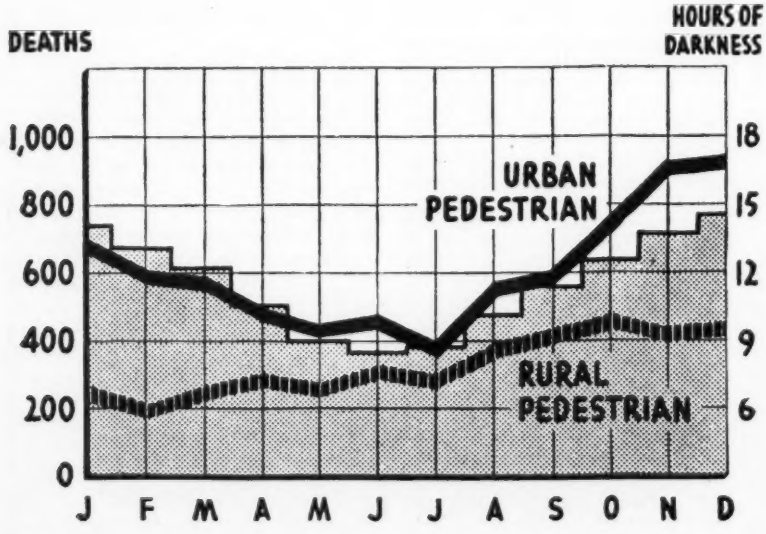
An average of 254 pedestrians are killed per month in the "after" period for each 100 killed before.

The "after" period is "by far the most dangerous for the pedestrian, especially in the fall and winter months," the Council report states. "In these months, nearly four times as many pedestrians are killed in the first three hours after sunset as in the three hours before sunset, although in these months the peak traffic hours come in daylight."

The Safety Council tabulates the number of pedestrians killed after sunset, per each 100 killed before, as follows:

January	330
February	414
March	255
April	270

1945 PEDESTRIAN DEATHS AND MONTHLY HOURS OF DARKNESS



Source: National Safety Council approximations

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When it comes to controlling parking you can do it better with DUALS

May	208
June	191
July	177
August	208
September	221
October	204
November	282
December	293

The important relation between traffic deaths and inadequate visibility is being stressed in a nationwide campaign sponsored by The Street and Traffic Safety Lighting Bureau of New York through its Cleveland, Ohio, office of informational services, which calls attention to the Safety Council statistics.

The Lighting Bureau claims that pedestrian deaths in hours of darkness have been reduced more than 50% by improved street lighting in Hartford and Bridgeport, Connecticut; Spokane, Washington; Detroit, Michigan; and Los Angeles and San Francisco, California.

"For true traffic safety," the Lighting Bureau adds, "brakes, steering, tires and other mechanical parts, no matter how excellent their condition, will never compensate for inability to see. Nor will visibility improve until the nation's 'horse and buggy' street lighting is modernized. Until this is done, little progress will be made in combating the traffic menace.

"Although a growing consciousness of the importance of adequate street lighting to traffic safety has stimulated modernization programs in some localities, the national traffic death rate will remain little changed until relighting becomes a fact in all of the nation's towns and cities," the Bureau statement concludes.

Statement of ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Traffic Engineering, published monthly at Plainfield, New Jersey, for October 1, 1946.

State of New York }
County of New York }

Before me a Notary Public in and for the State and County aforesaid, personally appeared Henry K. Evans, who, having been duly sworn according to law, deposes and says that he is the editor of Traffic Engineering and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, to wit:

1. That the names and address of the publisher, editor, managing editor, and business managers are:

Publisher—Institute of Traffic Engineers, 400 Watchung Avenue, Plainfield, New Jersey:

Editorial Office, 60 John Street, New York 7, N. Y., Editor is—Henry K. Evans, 60 John Street, New York 7, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and address of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation the names and address of the individual owners must be given. If owned by a firm, company or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

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5. That the average number of copies, of each issue of this publication, sold or distributed through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is .....
(This information is required from daily publications only.)

HENRY K. EVANS,
Editor.

Sworn to and subscribed before me this 18th day of October, 1946.

JUNE McGRANE
Notary Public — State of New York
Queens County

Queens Co. Clk's No. 1611, Reg. 29-Mc-7.

Certificates filed in N. Y. Co. Clk's No. 87 Reg. 38-Mc-7. Commission Expires March 30, 1947.